

Claims

What is claimed is:

1. A computer-based method of segmenting a set of data elements into one or more groups of data elements representing one or more objects, the method comprising
5 the steps of:

generating an optimized search function;

applying the optimized search function to the data elements of the set of data elements so as to prune a search space associated with the set of data elements; and

10 applying a match function to the pruned search space so as to segment the set of data elements into the one or more groups of data elements representing the one or more objects.

2. The method of claim 1, wherein the optimized search function is generated based on a randomly selected portion of data elements from the set of data elements.

15 3. The method of claim 1, wherein the step of generating the optimized search function further comprises the step of evaluating two or more search functions to determine which one of the two or more search functions substantially meets a particular match function criterion.

4. The method of claim 3, wherein at least one of the two or more search functions is unoptimized.

20 5. The method of claim 3, wherein at least one of the two or more search functions are selected from a catalog of candidate search functions.

6. The method of claim 1, wherein the step of generating the optimized search function further comprises the step of employing a learning algorithm.

7. The method of claim 6, wherein the learning algorithm comprises adaptively mutating one or more search functions during the generation of the optimized search function.

5 8. The method of claim 7, wherein the adaptive mutation of one or more search functions comprises random mutation.

9. The method of claim 8, wherein random mutation of a search function comprises randomly adjusting one or more parameters associated with the search function.

10 10. The method of claim 6, wherein the learning algorithm comprises combining two or more search functions during the generation of the optimized search function.

11. The method of claim 1, wherein the optimized search function prunes the search space by determining, given at least one data element, one or more lists of data elements in the set of data elements which are likely to be part of an object to which the at least one data element belongs.

15 12. The method of claim 11, wherein the step of determining whether a candidate data element from the data set is placed in one of the one or more lists is based on the at least one given data element and the candidate data element.

13. The method of claim 1, wherein at least one of the set of data elements and the match function is provided by a user.

14. The method of claim 1, wherein the set of data elements comprises unstructured image data.

15. A computer-based method of generating an optimized search function for use in segmenting a set of data elements into one or more groups of data elements representing one or more objects, the method comprising the steps of:

obtaining two or more search functions;

evaluating the two or more search functions to determine which one of the two or more search functions substantially meets a particular match function criterion; and

identifying the search function which substantially meets the criterion as the optimized search function for use in segmenting a set of data elements into one or more groups of data elements representing one or more objects.

16. Apparatus for segmenting a set of data elements into one or more groups of data elements representing one or more objects, the apparatus comprising:

15 at least one processor operative to: (i) generate an optimized search function; (ii) apply the optimized search function to the data elements of the set of data elements so as to prune a search space associated with the set of data elements; and (iii) apply a match function to the pruned search space so as to segment the set of data elements into the one or more groups of data elements representing the one or more objects.

17. The apparatus of claim 16, wherein the optimized search function is generated based on a randomly selected portion of data elements from the set of data elements.

18. The apparatus of claim 16, wherein generating the optimized search function further comprises evaluating two or more search functions to determine which one of the two or more search functions substantially meets a particular match function criterion.

19. The apparatus of claim 18, wherein at least one of the two or more search functions is unoptimized.

20. The apparatus of claim 18, wherein at least one of the two or more search functions are selected from a catalog of candidate search functions.

5 21. The apparatus of claim 16 wherein generating the optimized search function further comprises employing a learning algorithm.

22. The apparatus of claim 21, wherein the learning algorithm comprises adaptively mutating one or more search functions during the generation of the optimized search function.

10 23. The apparatus of claim 22, wherein the adaptive mutation of one or more search functions comprises random mutation.

24. The apparatus of claim 23, wherein random mutation of a search function comprises randomly adjusting one or more parameters associated with the search function.

15 25. The apparatus of claim 21, wherein the learning algorithm comprises combining two or more search functions during the generation of the optimized search function.

26. The apparatus of claim 16, wherein the optimized search function prunes the search space by determining, given at least one data element, one or more lists of data

elements in the set of data elements which are likely to be part of an object to which the at least one data element belongs.

27. The apparatus of claim 26, wherein determining whether a candidate data element from the data set is placed in one of the one or more lists is based on the at least one given data element and the candidate data element.

28. The apparatus of claim 16, wherein at least one of the set of data elements and the match function is provided by a user.

29. The apparatus of claim 16, wherein the set of data elements comprises unstructured image data.

10 30. Apparatus for generating an optimized search function for use in segmenting a set of data elements into one or more groups of data elements representing one or more objects, the apparatus comprising:

15 at least one processor operative to: obtain two or more search functions; (ii) evaluate the two or more search functions to determine which one of the two or more search functions substantially meets a particular match function criterion; and (iii) identify the search function which substantially meets the criterion as the optimized search function for use in segmenting a set of data elements into one or more groups of data elements representing one or more objects.

20 31. An article of manufacture for segmenting a set of data elements into one or more groups of data elements representing one or more objects, the article comprising a machine readable medium containing one or more programs which when executed implement the steps of:

generating an optimized search function;

applying the optimized search function to the data elements of the set of data elements so as to prune a search space associated with the set of data elements; and

applying a match function to the pruned search space so as to segment the set of data elements into the one or more groups of data elements representing the one or more objects.

32. An article of manufacture for generating an optimized search function for use in segmenting a set of data elements into one or more groups of data elements representing one or more objects, the article comprising a machine readable medium containing one or more programs which when executed implement the steps of:

10 obtaining two or more search functions;

evaluating the two or more search functions to determine which one of the two or more search functions substantially meets a particular match function criterion; and

15 identifying the search function which substantially meets the criterion as the optimized search function for use in segmenting a set of data elements into one or more groups of data elements representing one or more objects.

33. An object tracking system for segmenting a set of data elements into one or more groups of data elements representing one or more objects, the system comprising:

20 at least one processor operative to: (i) generate an optimized search function; (ii) apply the optimized search function to the data elements of the set of data elements so as to prune a search space associated with the set of data elements; and (iii) apply a match function to the pruned search space so as to segment the set of data elements into the one or more groups of data elements representing the one or more objects; and

25 memory, coupled to the at least one processor, for storing at least one of the set of data elements to be segmented and the one or more groups of data elements representing the one or more objects.